III. REMARKS

A. Introduction

Applicant has reviewed the Office Action dated December 23, 2004.

Applicant also thanks the Examiner for granting the Interview conducted May 4, 2005. Finally, Applicant thanks the Examiner for the extra time allowed for submitting this Preliminary Amendment.

B. Field of Invention

This invention generally relates to multi-polarization active array transmit antennas. In particular, the application describes a chip comprising phase shifters that control the scan angle, linear polarization, and circular polarization of an RF signal.

C. Pending Claims

Claim 1 has been amended.

Claims 2-45 have been cancelled.

Claims 46-65 have been added.

In sum, claims 2 and 46-65 are pending.

D. Summary of Interview

Applicant, Applicant's representative, and the Examiner conducted an Interview on May 4, 2005. At the Interview the parties discussed the prior art and claims.

E. Prior Rejections

Claims 1-10, 22-32, and 34-45 have been rejected as being anticipated by or obvious in light of Fassett, Jacomb-Hood, Nathanson, Caille, and Applicant's admission of the prior use of GaAs chips. Applicant has already responded to these rejections in prior

responses, including the response filed with the RCE on March 3, 2004. Applicant refers to those prior responses and incorporates them by reference herein. However, Applicant would like to clarify his position on various points.

In the most recent Office Action dated December 23, 2004, the Office states that Applicant's argument is not convincing because "the applicant alleges that the attenuator of Jacomb-Hood does not suggest any other purpose than compensating for mismatching. However, that is all the instant specification teaches as well. .... Thus, in the same fashion that the applicant's disclosure provides such to a skilled artisan so would such be enabling to a skilled artisan in light of Jacomb-Hood."

Applicant respectfully disagrees. As explained in a prior response to Office Action, the circuit diagram of Figure 1 discloses using attenuators for the claimed functions. It is true that Applicant's written description specifically mentions the attenuator's function of compensating for mismatching. The ability of an attenuator to attenuate a signal was not mentioned because this is well-known to those skilled in the art and is in fact the defining feature of an attenuator. Applicant's specification does mention the ability of the transmitter chip to control linear polarization, circular polarization, and scan angle. Armed with an understanding that attenuators attenuate signals and the functions of the transmitter chip, it would be apparent to one skilled in the art that the attenuators in the circuit of Figure 1 are one of the components that are used to control linear polarization, circular polarization, and scan angle. However, such understanding requires the help of Figure 1. Without Figure 1, a skilled artisan would not know how an attenuator could be used to accomplish these functions.

In other words, the use of attenuators as applied in the circuit of Figure 1 would not be readily apparent from the knowledge that attenuators can attenuate signals and compensate for mismatching. Similarly, without a circuit diagram, the use of transistors and diodes to process three-dimensional graphics would not be apparent to a skilled artisan. Such functions are not readily apparent from a mere knowledge of the basic electrical properties of transistors and diodes, even if the more complicated functions of AND and NOT gates were explained.

In short, the use of attenuators to control scan angle and polarization is not obvious from the prior art because the prior art does not have the benefit of Figure 1.

In reference to the prior art, Applicant points out that none of the prior art references or combinations disclose or suggest using an attenuator to control scan angle, among other claimed features. A more complete response to the individual rejections can be found in prior Responses by the Applicant to the prior art rejections.

In short, Fassett (US 4,088,970) does not disclose an attenuator at all. Jacomb-Hood (US 4,806,944) discloses an attenuator, but only to compensate for mismatching. Unlike Applicant's Figure 1, the circuits of Jacomb-Hood also do not teach or suggest using an attenuator for anything other than compensating for mismatching. Thus, the combination of Fassett and Jacomb-Hood at least fails to disclose using an attenuator to control scan angle. Rather, the combination of Fassett and Jacomb-Hood teaches a scan angle with constant power of the RF signal across the scan angle. The use of the attenuator to normalize the power would not affect the scan angle at all.

Nathanson's (US 4,823,136) circuit is not capable of producing a polarized signal, either linear or circular. The attenuator in Nathanson cannot be used to control linear polarization or scan angle. Fassett does not remedy these deficiencies.

Although Caille's attenuator may control polarization angle, Caille does not disclose using an attenuator to control scan angle. Also, while Caille's attenuator may control polarization angle, its phase shifters do not. Although Fassett discloses using phase shifters to control polarization angle, Caille cannot be combined with Fassett because they use different principles of operation that could not be combined with one another. Caille discloses a 2-channel T/R module, while Fassett contains a coupler. It is not apparent to Applicant, nor would it be apparent to any other skilled artisan, how it would be possible to combine a polarization switch (Fassett) with a T/R circuit (e.g., Figure 5 of Caille). A combination of the two would eliminate either the transmitter or the receiver of Caille, thereby frustrating Caille's purpose. Regardless, it is not apparent how the two could be combined to achieve the claimed functions of the attenuator.

Various other features of the rejected claims distinguish over the prior art. For instance, the claimed feature that the various circuit elements for controlling scan angle and polarization are on a single GaAs chip is not disclosed or suggested in the prior art.

For at least these reasons, Applicant respectfully requests that the rejection of these claims be withdrawn. As claim 1 is the only pending claim that was rejected prior to this amendment, Applicant respectfully requests that the Examiner withdraw the rejection of claim 1.

F. Pending Claims

Claim 1 has been amended to incorporate features of the dependent claims, and it is believed that the claim as amended distinguishes over the prior art.

The prior rejections do not apply to the new claims. As requested by the Examiner, the new claims recite specific structure of the circuit shown in Figure 1, such as the two channels that output to the coupler. For instance, new independent claim 46 recites several specific electronic component features of the circuit in Figure 1. Many of the claims depending from claim 46 and new independent claim 65 recite the structure of the circuit in greater detail.

Applicant respectfully requests consideration of these claims and respectfully submits that all pending claims distinguish over the prior art.

VI. Conclusion

Applicant respectfully submits that the claims as amended are supported by the specification and therefore add no new matter. Applicant further submits that the application is in condition for allowance and respectfully requests a notice of allowance for the pending claims. Should the Examiner determine that any further action is necessary to place this application in condition for allowance, the Examiner is kindly requested and encouraged to telephone Applicant's undersigned representative at the number listed below.

Respectfully submitted,

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